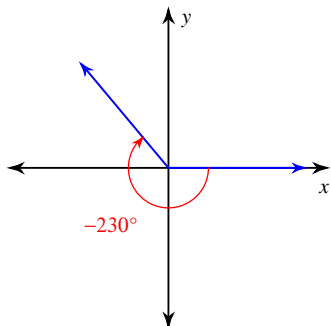


Coterminal Angles and Reference Angles

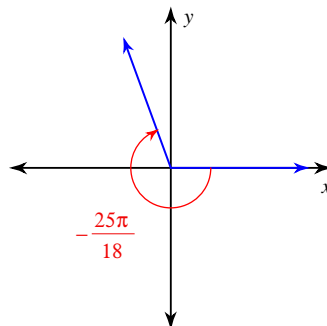
Date _____ Period _____

Find the reference angle.

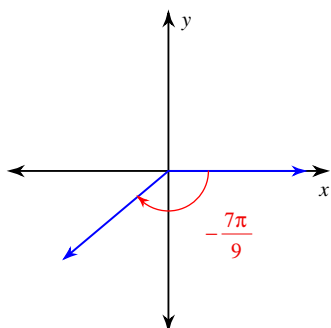
1)



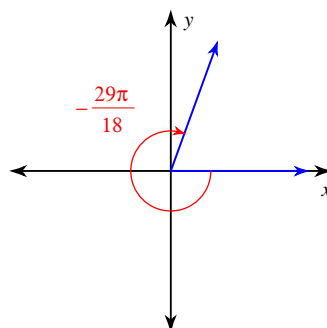
2)



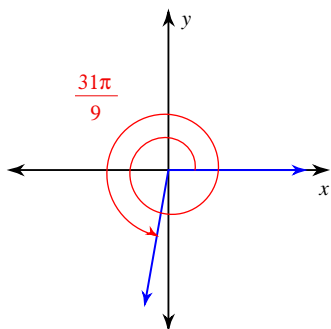
3)



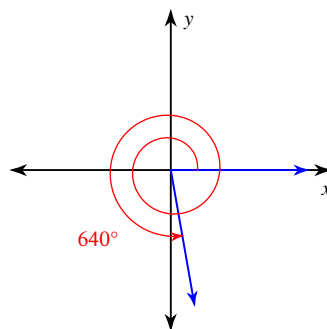
4)



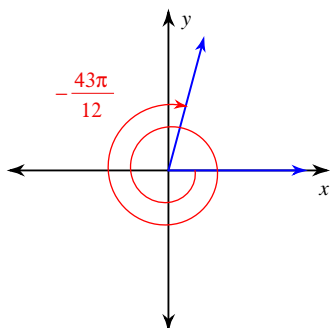
5)



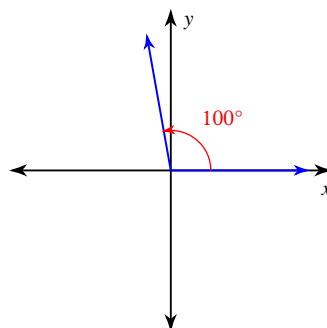
6)



7)



8)

9) -510° 10) $-\frac{19\pi}{18}$ 11) $-\frac{13\pi}{12}$ 12) -250° 13) $-\frac{5\pi}{6}$ 14) $\frac{13\pi}{18}$

State if the given angles are coterminal.

15) 240° , 600°

16) 90° , 290°

17) 185° , -545°

18) $\frac{41\pi}{36}$, $\frac{9\pi}{4}$

19) $\frac{17\pi}{36}$, $\frac{161\pi}{36}$

20) $\frac{7\pi}{9}$, $-\frac{25\pi}{9}$

Find a coterminal angle between 0° and 360° .

21) -330°

22) -435°

23) 640°

24) -442°

Find a coterminal angle between 0 and 2π for each given angle.

25) $\frac{11\pi}{3}$

26) $-\frac{35\pi}{18}$

27) $\frac{15\pi}{4}$

28) $-\frac{19\pi}{12}$

Find a positive and a negative coterminal angle for each given angle.

29) $\frac{5\pi}{4}$

30) $\frac{25\pi}{36}$

31) $-\frac{7\pi}{6}$

32) $\frac{29\pi}{45}$

33) $\frac{7\pi}{9}$

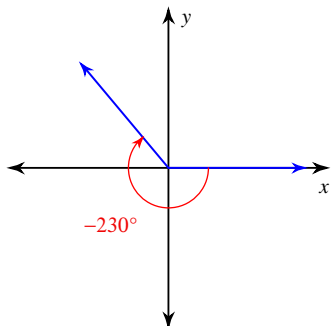
34) $\frac{3\pi}{4}$

Coterminal Angles and Reference Angles

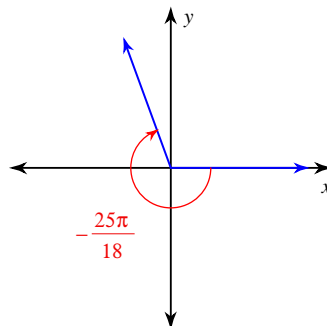
Date _____ Period _____

Find the reference angle.

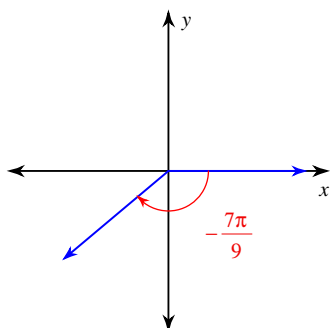
1) 50°



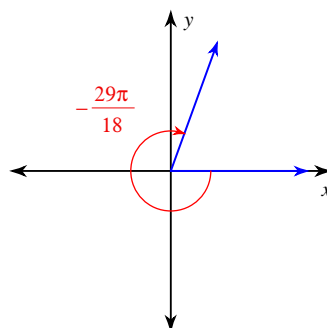
2) $\frac{7\pi}{18}$



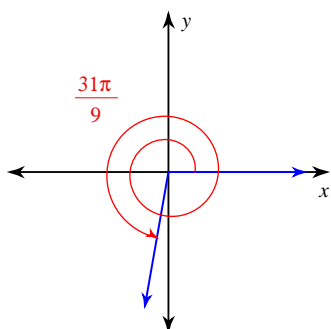
3) $\frac{2\pi}{9}$



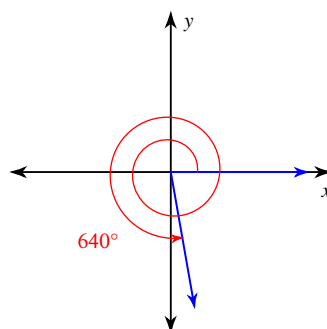
4) $\frac{7\pi}{18}$



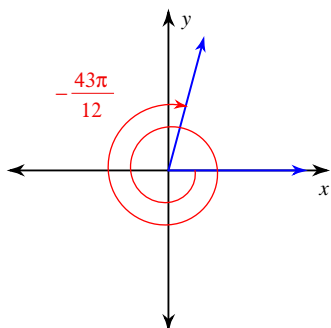
5) $\frac{4\pi}{9}$



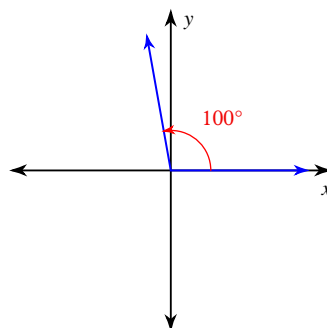
6) 80°



7) $\frac{5\pi}{12}$



8) 80°



9) -510° 30°

10) $-\frac{19\pi}{18}$ $\frac{\pi}{18}$

11) $-\frac{13\pi}{12}$ $\frac{\pi}{12}$

12) -250° 70°

13) $-\frac{5\pi}{6}$ $\frac{\pi}{6}$

14) $\frac{13\pi}{18}$ $\frac{5\pi}{18}$

State if the given angles are coterminal.

15) 240° , 600°

Yes

16) 90° , 290°

No

17) 185° , -545°

No

18) $\frac{41\pi}{36}$, $\frac{9\pi}{4}$

No

19) $\frac{17\pi}{36}$, $\frac{161\pi}{36}$

Yes

20) $\frac{7\pi}{9}$, $-\frac{25\pi}{9}$

No

Find a coterminal angle between 0° and 360° .

21) -330°

30°

22) -435°

285°

23) 640°

280°

24) -442°

278°

Find a coterminal angle between 0 and 2π for each given angle.

25) $\frac{11\pi}{3}$ $\frac{5\pi}{3}$

26) $-\frac{35\pi}{18}$ $\frac{\pi}{18}$

27) $\frac{15\pi}{4}$ $\frac{7\pi}{4}$

28) $-\frac{19\pi}{12}$ $\frac{5\pi}{12}$

Find a positive and a negative coterminal angle for each given angle.

29) $\frac{5\pi}{4}$

$\frac{13\pi}{4}$ and $-\frac{3\pi}{4}$

30) $\frac{25\pi}{36}$ $\frac{97\pi}{36}$ and $-\frac{47\pi}{36}$

31) $-\frac{7\pi}{6}$

$\frac{5\pi}{6}$ and $-\frac{19\pi}{6}$

32) $\frac{29\pi}{45}$ $\frac{119\pi}{45}$ and $-\frac{61\pi}{45}$

33) $\frac{7\pi}{9}$

$\frac{25\pi}{9}$ and $-\frac{11\pi}{9}$

34) $\frac{3\pi}{4}$ $\frac{11\pi}{4}$ and $-\frac{5\pi}{4}$